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The experiments attempted to measure achievement, motivation, delay of gratification, aspects of perception development, cognition, and language of culturally deprived preschool children. There were four experimental groups: children attending summer school for three years and having contacts with a home visitor in the fall, winter, and spring months; children attending summer school for two years and having similar home visitor contacts; a control group in the same town; and an additional control group in another town. Every group of 22 children had one head teacher plus four small group teachers.

Activities used included field trips, counting exercises, language development exercises, and reading to the children. One of the language development exercises used dramatized such simple stories as Little Red Riding Hood and The Little Red Hen.

Proper evaluation of the experiment cannot be made until the children have attended school for a number of years. However, on an elaborate battery of preschool screening tests given to all children entering the first grade in the main city, the experimental children scored higher than the controls and tended to approximate the non-deprived children in the school. They were also superior on reading readiness tests.

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AN EXPERIMENTAL PRESCHOOL PROGRAM FOR CULTURALLY DEPRIVED CHILDREN*

Susan W. Gray and Rupert A. Klaus
George Peabody College

As my part this morning of the symposium on Early Experiential Deprivation and Enrichment and Later Development, I should like to discuss with you some of the research that I have been involved in for the last three years, some of our findings and some of the convictions that grow out of our work.

The particular research is an intervention project with young children. It has as its major purpose an attempt to see if it is possible, by specially planned techniques, to offset the progressive retardation in cognitive development and school achievement that characterize the culturally deprived child as he passes through his years of schooling.

The general strategy of the research in which Rupert Klaus of Peabody and I have been engaged is based upon the fact that, short of a complete change of milieu for children in infancy, we have yet to demonstrate that it is possible to offset in any major way the progressive retardation with which we are concerned. And so we have attempted to develop a research package in which we have placed those variables which, on the basis of research on social class, cognitive development, and motivation, seemed most likely to be related to the differences in school performance between the middle class child and the culturally deprived youngster. At the same time, we have attempted to do this within a framework which it would be possible to employ on a wide spread scale should the project prove successful.

The subjects with which we are working are 60 children in a city of 25,000 in the upper South plus an additional group fo 27 children in a nearby town who serve as a second control group, which I shall explain presently. These children were selected on the basis of father's or mother's occupation, education, housing conditions, and income. Our parents' incomes at the beginning of our study were well below the present $3000 cutting point for poverty; their occupations were unskilled or semi-skilled, with some additional mothers on ADC; their educational level is eighth grade or below; their housing conditions are poor. Most of them have television sets, but no books or magazines, and little in the way of toys for the children. The median number of children is five; in nearly half of the homes there is no father present. All of our children were born in 1958 and have entered school this past September. These children are all Negro, although our main interest is with the problem of cultural deprivation. We chose Negro children because at the time we began our study the schools of the city were segregated. It seemed wise to work with either one color group or the other, and we had reason to believe that in the particular setting our chances of success were greater with the Negro group.

The procedures we used in our work with these youngsters over the years -- and which I shall describe presently -- grew out of the literature on differences

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in social class, in child-rearing practices, in motivational patterns, in language, and in perceptual and cognitive development. They were also influenced by our observations of, and speculations upon, the effects of the experiences our children were receiving within their homes.

One way we have attempted to structure these experiential differences is in terms of three stimulus-potential and five reinforcement dimensions that seem applicable in observing young children.

The possible stimulus dimensions we listed as these:

a. Gross amount of potential stimulus input. Here we doubt that the culturally deprived child receives a lesser amount than the more privileged. An average of four noisy siblings in a small household would seem to guarantee this.

b. Number of different kinds of stimulus input. Here it is probable that the culturally deprived child, particularly as he grows older, will find less variety in stimulation.

c. Figure and ground relationships. It is likely that the noisy, active home of the culturally deprived child is so full of conflicting stimuli that the child is unable to attend to those stimuli most relevant in terms of increased intellectual development. These homes, for example, are the ones where the television set booms from morning till night, no matter what else people are trying to do.

We are inclined to think, however, that cultural deprivation, at least as we have used the term, is more likely to arise from the particular patterns of interaction of children with others, and these we have grouped as reinforcement variables. There are five such dimensions which may be relevant.

1. Total amount of reinforcement. Since adults, and specifically parents, will tend to be the major reinforcing agents for small children, the culturally deprived may receive a smaller gross amount of reinforcement, since the time and energy of the child-caring agent will tend to be directed toward subsistence activities. In conversation one time, Terry Prothro expressed this point in a way I like: That the culturally deprived mother will tend to spend her time coping with rather than shaping the behavior of the child.

2. The source of reinforcement. The lack of adult reinforcing persons will mean not only that the culturally deprived child will receive less reinforcement but also that what he gets may occur in greater frequency from peers and siblings, and from his own sensations--as the pleasure of gross motor activity in racing about, riding a tricycle, and the like.

3. From his position in the first two dimensions, it follows that the culturally deprived child will receive less verbal reinforcement. Even where the parent is the reinforcing agent, it is likely that there will be much less in the way of verbal responses, particularly of complex ones (or in Bernstein's terms of the use of an elaborated code.)

4. The direction of the reinforcement. In a home where the major concern

is with coping rather than with shaping, not only may there be less reinforcement, but also, reinforcement, will be given for those behaviors that make coping easier; in a word, children will be rewarded for inhibitory rather than exploratory behavio It is likely that our children learn quite early that the best way to stay out of trouble is keep out from under foot and to be quiet. In such an environment, the natural" curiosity of the child may wither for lack of encouragement. I expect that it is upon this dimension that Piaget's work seems particularly classbound.

And 5. What might be called the <u>focus of the reinforcement</u>. Is it diffuse the "you're a <u>bad</u> girl, or you're a <u>fine</u> boy" kind of generalized approval, or is it focussed precisely on the adequacy of the child's performance? Some of the work of Zigler on verbal reinforcers and that of Bernstein on language codes would suggest that the diffuse type of verbal reinforcement may be more characteristic of the deprived than of the more privileged. Where reinforcement is diffuse, the child's attention is not directed toward the quality of the performance, nor is it possible to become self-reinforcing in terms of evaluating and improving his own performance.

From the standpoint of the three stimulus variables, we speculate that the children in our project came to us without having had contact with many of the objects and experiences commonplace to middle class youngsters. In addition we suspect that these youngsters have lived in an environment that provided sufficient distraction in the way of extraneous stimuli that the children could not take advantage of what learning potential did exist in the home.

In terms of the five reinforcement variables, we think it likely that the children would arrive for their first preschool expereinces in our project with behavior not too well under the control of adult verbal direction; that they would be highly responsive to adult reinforcement of a non-verbal sort (hugs, pats, being carried, and the like); and that they would tend to approach new situations by inhibiting behavior rather than by exploring. Our problem was to take advantage of the motivational patterns already built up and move the children toward motivational patterns more in keeping with those which would be likely to be associated with success in school.

What actually went on in our daily work with the children of our two experimental groups can probably be best explained by showing you pictures of these youngsters engaged in the activities of their summer school. Before launching into these, however, I should like to take a moment to summarize the variables we are attempting to manipulate. One major class of variables relates to attitudes toward achievement. In terms of the children's attitudes, we have been particularly concerned with achievement motivation, especially as it relates to school type tasks, with persistence, with ability to delay gratification, and with general interest in school-type activities, such as looking at books, drawings, singing, and the like. We have attempted to translate these variables into certain operational procedures for the teachers and assistants who have worked directly with the children. We have also been concerned with the parent's attitude toward achievement, particularly as it relates to their aspirations for their children and their concern with the child's schooling in relation to these aspirations. This we have largely carried on through our home visitor program, in which a specially trained preschool teacher meets weekly with each parent. Our other major class of variables has been that of aptitudes for achievement. Here our concern has

been with perceptual and cognitive development, and with language. We have tried to provide many and varied experiences and materials for the children, we have encouraged them to talk about these experiences, to classify and relate them. But these things you can see better in the pictures that follow.

From now on, I would like to talk to some slides taken over the two and a half years of the study. The first is a layout of the general experiment design. If you will look at this for a moment with me, you can see the general plan. Reading across the top, you will see that we have four treatment groups: The first has three summer school experiences, the contacts with a home visitor in the fall, winter and spring months, the second has two summer school experiences and similar home visitor contacts, the third is a control group in the same town, the fourth is an additional control group in another town. In our main town, children were assigned randomly to the three groups. If you read down the table now, you see that we began our intensive summer school experience with the first group two years ago this past summer, and with our second group one year later. In the summer just past we worked with both groups, and this fall, all our children began the first grade of public school. The home visitor is continuing to work with the parents of the children in the two experimental groups during the first year of schooling. Also as you read across the chart you can see that we have systematically tested all four groups before and after the summer school experiences, and will follow them through the second grade of school with such tests. Actually we shall continue to follow them beyond this time, but our research support, from NIMH for the study proper, is for the five year period outlined in the table. Our crucial comparisons will be based upon performance of these children during their school years.

Let us begin now by looking at pictures of the homes from which our children come. Here is a typical street, and here is one of the poorest homes, outside and inside. The little boy in the middle is in our first treatment group. Next is another of our poorest--and most disorganized homes. The little boy from this home has occasionally missed school because he has "nothing to wear". The next home is about average among our homes. I have included it particularly because of the marriage certificate on the wall. Battered as it is, it indicates considerably more stability than is characteristic of the homes of our children.

Next, as we move into our summer school programs, I would like to show you a picture of our staff. This shot, taken after a hard day of getting plans set up for our first day with the children indicates the general composition of the staff--we had one head teacher for each 22 children, plus four small group teachers, to make it possible to provide intensive adult-child interaction for all the youngsters. We felt this particularly important in changing the motivation patterns of the children. With only 4 or 5 children to each adult, it was possible to reinforce children immediately for any desired behavior; it was possible to encourage the child to talk more frequently and to talk with him on an individual basis. These adults we saw as identification figures for the children as well as teachers. You can see that we tried to balance the group as to sex and as to color. Our two head teachers were experienced primary teachers; the small group teachers were college students plus some trainees in the school psychology program.

The next two pictures are ones taken of the group which began summer before last on its first day. Not all were as fearful as this little girl

but all were wide-eyed, and somewhat cautious.

One of our major pushes during each of the summers was to provide the child with a wide variety of new experiences, opportunities to explore, to manipulate and to talk about what one was finding that was new. Here you see two little boys at the age of about three and one-half having their first experiences with finger paint. The child on the right is the one you saw in the house with all the clothes. Next a young artist the first time he touched brush to canvas, or newsprint. Here is a group of children during one of their early encounters with musical instruments. This child is examining his hand under a tripod microscope.

The son of one of our teachers brought his mare one day and her two week's old colt. Those children who were brave enough -- and about half of them were -- got to ride the mare.

We go on now to several pictures taken on field trips, of which there were many. One of the best places for broadening their contacts was upon some of the farms nearby. Here you see the head of a young calf surrounded by a group of other little round heads. And next they are feeding the hogs. A trip to the Children's Museum, in a large city nearby, was one of the high points of the summer just past. Only two of the children or their mothers had ever been in a public library before we arranged a visit. We understand now that, with the encouragement of the home visitor all the mothers in the first treatment group except two have taken their children there, and many are checking out books on a regular basis. We went to an airbase, and these children, most of whom had never seen airplanes on the ground, could actually climb into them.

The next group of pictures has been selected to show our efforts in trying to stimulate their motivation to achieve, to persist, to attempt new things, to strive toward a delayed goal. In the beginning we found that our most appropirate activities for stimulating achievement motivation were motor ones. The jungle gym was a favorite way of feeling "on top of the world", as you can see from this young Alexander Selkirk.

Blocks were highly attractive to the children and we encouraged them to build towers as high as they possibly could, and then rejoiced with them over their prowess. They used the little blocks and the big blocks. Their paintings we hung on the wall and encouraged the children to show them to teachers, to other children, and eventually to take home to their mothers. Little progress charts of various kinds were devised by the small group teachers. On this one, as the children are rapidly approaching first grade, literally as well as figurative they received a new footprint to paste on the chart for each completion of a new puzzle.

The next three pictures represent one of our emphases particularly with the little boys. Nearly half of these had no fathers in the home, and of the others in many cases, as is typical in the lower class, the father had either never assumed or else had abdicated any measure of parental responsibility. We felt that father figures who could also serve as achieving role models were particularly improtant for these young boys.

Let us go now to some pictures of how we attempted to develop aptitudes for school achievement. One of the early ways in which middle class children

learn to classify and relate objects of their world is in terms of number and color. Our children came to us at the ages of three and a half to four and a half with little ability to name colors or to count. Here they are getting ready for a special production of Ten Little Indians one of many counting songs and games used.

This next picture, although you might not guess it, is also about counting. The puppy the child is holding is exactly as many days old as the number of fingers on both her hands. Here the teacher has asked the children to build a jail house around her, and each child is given a different color to use. We move on now to somewhat more complex tasks. Here are two little girls, the first summer working a very simple pegboard design--one red row across the top. Next one of the two children, during the second summer, is trying to arrange pegs in an S, the first letter of her name. And here she is again, during the third summer, working on a very complex design indeed. The little boy is making a pegboard village to match the sample, and doing a creditable job -- but in mirror image. Here we have three youngsters who during the first year found even the simplest wooden puzzle a challenge. And here, in the third summer, one little girl is starting -- and now completing, after working for some thirty minutes, a puzzle of some 60 pieces. This child is building a red barn for her toy cow, and this one is learnir to put the red barn in the green square.

We spent a great deal of time on language development. This was part and parcel of all our activities from eating lunch to planning for a trip to the fire house. We encouraged the children todramatize simple stories; here is a picture of Little Red Riding Hood going through the woods to see her grandmother The child confided to me later that she had been frightened of the wolf all the while. The next two pictures are of a dramatization of the Little Red Hen which the children did in a special program for their mothers. The little creatures with yellow nose cones and wings are the Little Red Hen's chickens.

Books of course were our mainstay. We read to the children constantly. We encouraged them to look at pictures as we read, and presently we brought them to the point where looking at pictures was for them an absorbing activity.

These little scholars are the last of our pictures. It remains now to tell you something of the results that we are finding. Our curcial comparisons are still in the future. It is not until the children have been in school for some time that we will be able to judge whether or not we have been able to offset the progressive retardation in school performance that would probably be their lot without intervention. We have, however, collected a large amount of data as we have gone along. Some of this is on various aspects of the children's social development and on attitudes. The only material, however, which I should like to report to you will be on some of the standardized tests of intelligence and language development.

First for the results on the Binet. This slide (Figure 1) shows the results of five successive testings upon the Binet for the four treatment groups. These graphs are a little deceptive, since we did not give the Binet in May of '64 as we had done in the prior two years. Our reason for this was simply to avoid too much testing. At that time we gave them the WISC. On the present slide you can see that the two experimental groups, T_1 and T_2, are diverging from the two control groups -- T_3 the group in the same city, and T_4, the distal control group. The mean IQ of our first treatment group before we began our study was 86. It now stands at 95, a gain of 9 points. The second treatment group, with which we began

a year later had an original mean IQ of 91 and has shown a gain of 5 points. The two control groups have decreased, the local group showing a loss of 4 points and the distal group of 6 points. Differences between experimental and control groups are significant at the .05 level and beyond. The differences between the first and second treatment group did not reach the criterion we set for statistical significance, but the difference does reach the .08 level.

Since the major purpose of our study is to see whether it is possible to offset progressive retardation, I decided to play a little with the data and make comparisons of actual test scores on the Binet in terms of mental age with what we might expect to happen if we make assumptions about the IQ as an index of rate of development. This slide (Figure 2) shows again the growth curves on the Binet for the first experimental group and for the distal control group -- the two groups which we predicted would differ most. Each group shows three lines. The solid line represents the observed test results in terms of mental age. The line with the short dashes shows what we might predict for a child who was making a month's gain in mental age for each calendar month, that is, with an IQ of 100. The third line shows what we might predict taking the child's IQ on first testing, where the mean was 86, and predicting 86 per cent of normal gain over the period. Here you can see that in the first experimental group the observed scores are evaluated beyond either of the other two curves, and that the observed curve parallels during the last few testings what might be predicted with an IQ of 100. If this relationship continues, it looks as if we have offset the progressive retardation to be expected. In the fourth group, the distal controls, we would seem, so far, to have a clear case of progressive retardation, where the observed scores are diverging even from that which might be predicted on a basis of an IQ of 86 rather than 100. The difference between observed gain in mental age and that predicted on the basis of an IQ of 86 is 8 months in the positive direction for T_1; for T_4 it is 5 months in the negative direction. I do not take this 13 months' difference too seriously, but do find it an interesting, if somewhat fanciful, way of looking at the data.

The next slide (Figure 3) shows our findings upon the Peabody Picture Vocabulary Test, which we have administered at each testing session, with alternation of Forms A and B. Our findings in general are similar to those on the Binet, although we do not find any tendency for the first treatment group to surpass the second.

Our children have also twice been administered the Illinois Test of Psycholinguistic Ability. This slide (Figure 4) shows results with the two experimental groups combined, and with the two control groups similarly combined. This combining was done simply to make the figure, (with the large number of subtests) easier to interpret. The perpendicular dashed line indicates the chronological age of the children and presumably where their scores should fall if they were functioning at normal capacity for their ages. In general it can be seen that even with the experimental groups, functioning is somewhat below normal for their age, although on three of the subtests they function beyond expectancy. Experimental children are significantly (at the .05 level) superior to the control children on all subtests except that of motor encoding, No. 6. To me the most interesting aspect of this curve is the almost parallel nature of the two curves, the mean difference in language ages being eight months.

These are the last of my slides. The children are now in school and we are rapidly reaching the point where we can begin to evaluate possible differences in school performance. On an elaborate battery of preschool screening tests given to all children entering the first grade in our main city, the experimental children did conspicuously better than the controls, and tend to approximate the non-deprived children in the school. On reading readiness tests they are again superior.

It is not until our children have been in school for several years, however, that we can know whether we have been able by this massive attack to offset the effect of a culturally deprived environment as it affects school performance. As we wait for, and plan toward these years, we are also engaged in collecting data which we hope will give us a clearer picture of our success -- or lack of it -- in manipulating those variables, we have assumed, on the basis of previous research, to be related to school performance. Thus we are attempting to measure achievement motivation, delay of gratification, some aspects of perceptual development and cognition, and language. In this way, if we are successful in altering appreciably the school performance of these children, we can look back at changes in our sub-variables for clues as to the most potent of these in affecting school performance.

Neither Rupert Klaus nor I, the two principal investigators of this project are so sanguine as to think that we can work out a major solution for amelioratin the plight of the culturally deprived. We have, however, planned and are far along in carrying through a program that takes its cue from psychological research upon the development of motivation and intellect, and that attempts to use this in the context of a program that is developmental rather than remedial. If our research project should prove successful we will have added some small amount to the store of knowledge sorely needed in order to cope with this major social problem for America -- and the world. If it fails, it will not be for lack of trying.

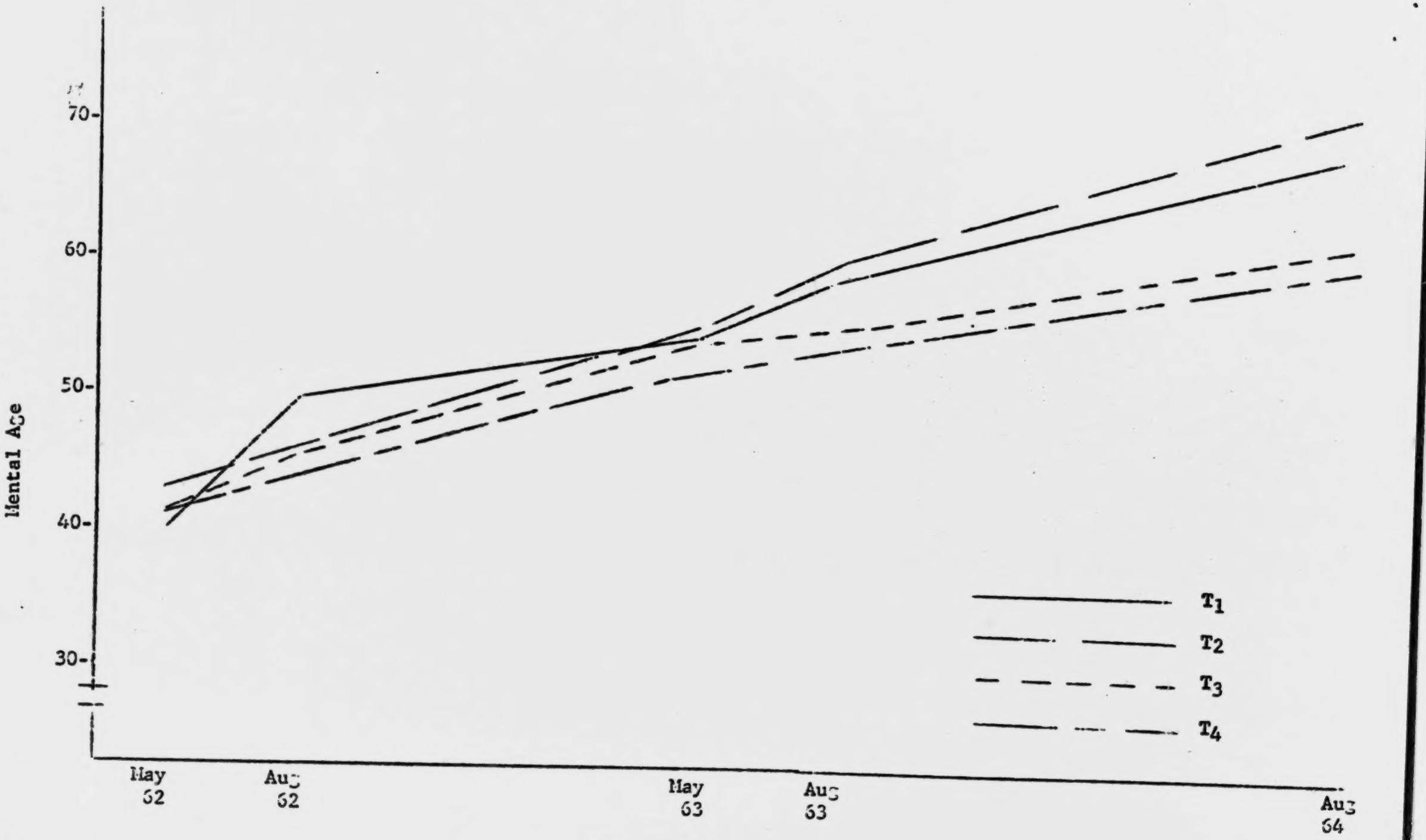

Figure 1

Binet Mental Age Scores for ETP Training and Control Groups

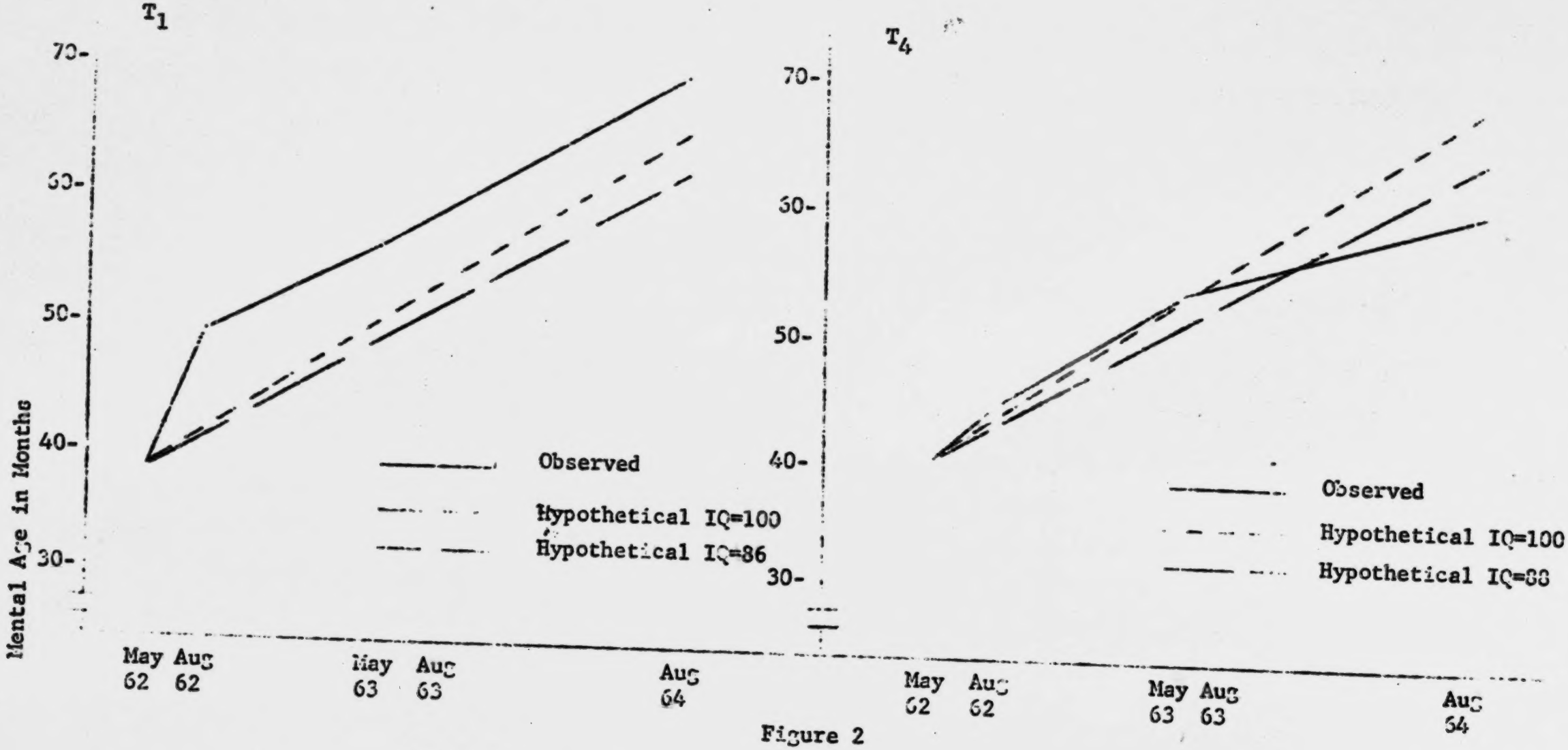

Figure 2

Hypothetical and Observed Binet Mental Age Development for ETP T_1 (Training Group) and T_4 (Distal Control Group)

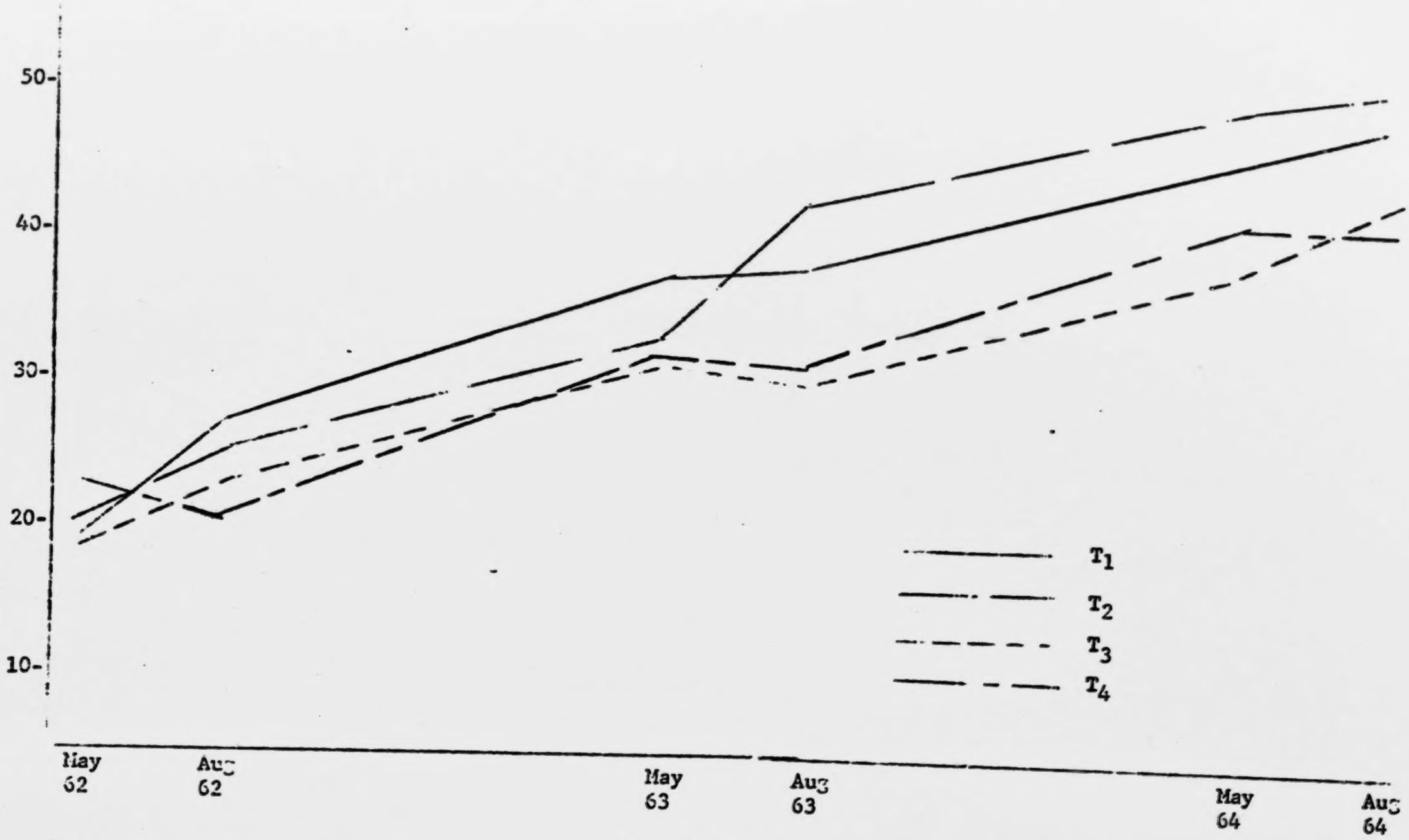

Figure 3

PPVT Raw Scores for ETP Training and Control Groups

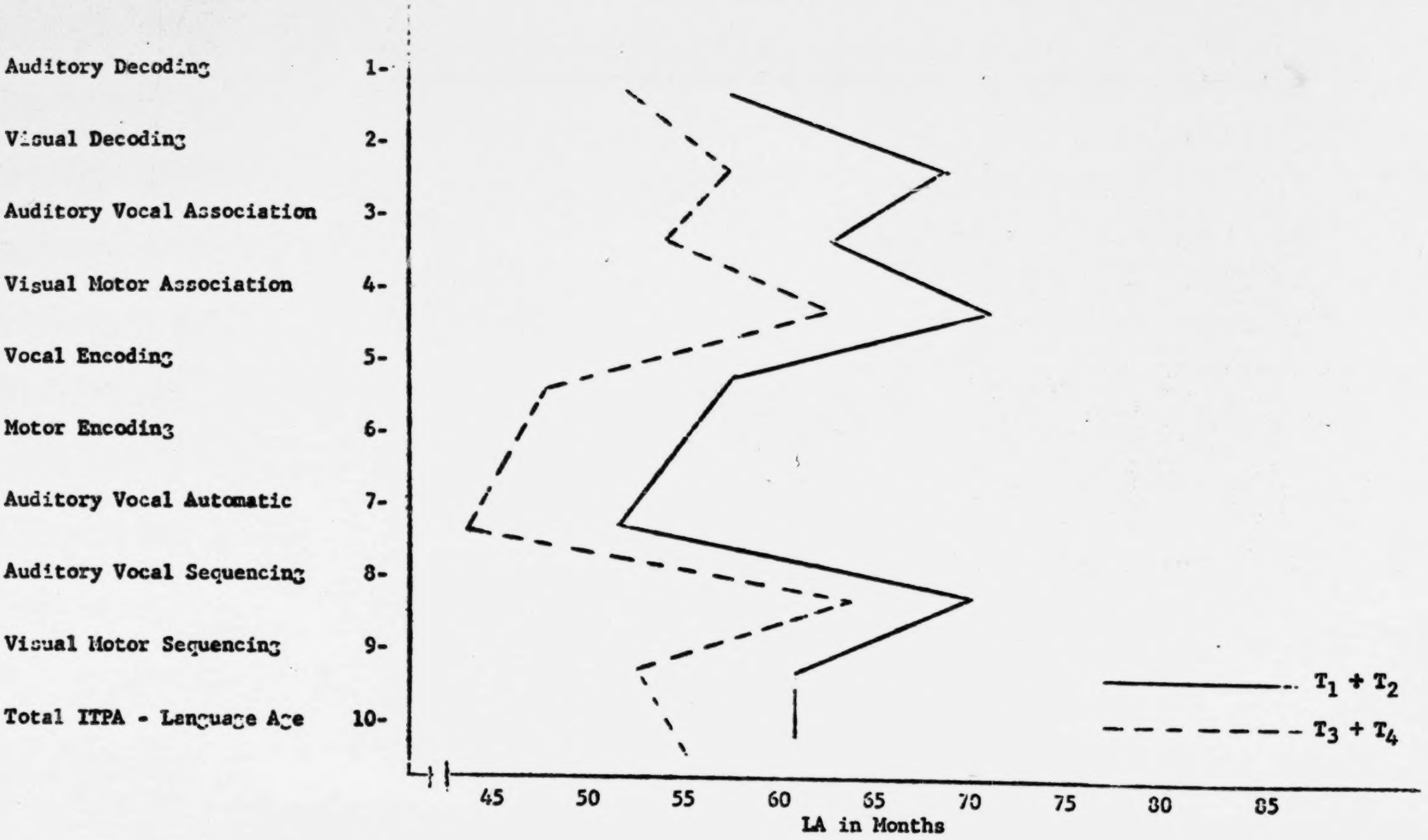
Auditory Decoding 1-
Visual Decoding 2-
Auditory Vocal Association 3-
Visual Motor Association 4-
Vocal Encoding 5-
Motor Encoding 6-
Auditory Vocal Automatic 7-
Auditory Vocal Sequencing 8-
Visual Motor Sequencing 9-
Total ITPA - Language Age 10-
$T_1 + T_2$
$T_3 + T_4$
45 50 55 60 65 70 75 80 85
LA in Months

Figure 4

Illinois Test for Psycholinguistic Abilities Mean Language Ages

for ETP Training and Control Groups, August 1964